

Claims

[c1] In a hand-held liquid extraction cleaner for cleaning a surface and comprising:
a housing forming handle at an upper portion thereof for carrying the extraction cleaner;
a liquid extraction system mounted to the housing and including:
a suction nozzle;
an air-liquid separator integral with the housing and in fluid communication with the suction nozzle, for separating air from liquid and debris;
a recovery tank in fluid communication with the air-liquid separator for collecting recovered liquid and debris separated from air in the air-liquid separator;
a vacuum source in fluid communication with the suction nozzle and the air-liquid separator, whereby the vacuum source can draw liquid and debris through the suction nozzle and deposit them into the recovery tank; and
a liquid dispensing system including:
a cleaning fluid supply tank; and
a spray nozzle connected to the cleaning fluid supply tank for spraying cleaning fluid onto the surface to be cleaned;
the improvement comprising:
at least one agitator mounted to the air-liquid separator adjacent to the suction nozzle for rotation about an axis and for scrubbing the surface to be cleaned;
and
a motor carried by the housing and operably connected to the agitator to drive rotation of the agitator about the axis of rotation.

[c2] A liquid extraction cleaner according to claim 1 wherein the recovery tank is removably mounted to the air-liquid separator.

[c3] A liquid extraction cleaner according to claim 1 wherein air-liquid separator is mounted to a front portion of the housing adjacent to the suction nozzle.

[c4] A liquid extraction cleaner according to claim 1 wherein the suction nozzle is elongated and has a longitudinal axis, and the axis of rotation of the at least one agitator is parallel to the longitudinal axis of the suction nozzle.

[c5] A liquid extraction cleaner according to claim 1 wherein the motor is mounted to the air-liquid separator.

[c6] A liquid extraction cleaner according to claim 1 wherein the motor that drives the at least one agitator is operable independently of the vacuum source.

[c7] A liquid extraction cleaner according to claim 1 wherein the at least one agitator has more than two rows of bristles.

[c8] A liquid extraction cleaner according to claim 1 there are two agitators rotatably mounted to the air-liquid separator.

[c9] A liquid extraction cleaner according to claim 8 wherein the two agitators are driven by the motor in opposite directions.

[c10] A liquid extraction cleaner according to claim 8 wherein the suction nozzle is elongated and has a longitudinal axis, and the axes of rotation of the agitators are parallel to the longitudinal axis of the suction nozzle.

[c11] A liquid extraction cleaner according to claim 8 wherein the motor that drives the agitators is operable independently of the vacuum source.

[c12] A liquid extraction cleaner according to claim 8 wherein the agitators are brushes and each of the brushes have at least two rows of bristles.

[c13] A liquid extraction cleaner according to claim 1 wherein the at least one agitator has a plurality of flexible paddles extending radially therefrom.

[c14] A liquid extraction cleaner according to claim 13 wherein the suction nozzle is elongated and has a longitudinal axis, and the axis of rotation of the agitator is parallel to the longitudinal axis of the suction nozzle.

[c15] A liquid extraction cleaner according to claim 13 wherein the motor that drives the roller is operable independently of the vacuum source.

[c16] A liquid extraction cleaner according to claim 1 wherein the agitator comprises two rollers rotatably mounted to the housing next to the suction nozzle, each of the rollers having a plurality of flexible paddles extending radially therefrom

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and rotatable in a direction opposite the other.

[c17] A liquid extraction cleaner according to claim 1 wherein the recovery tank comprises visual indicia to indicate a maximum capacity of recovered liquid and debris.

[c18] A liquid extraction cleaner according to claim 1 and further comprising a lamp assembly mounted to a front portion of the air-liquid separator and connected to a source of electrical energy for illuminating the surface to be cleaned.

[c19] In a liquid extraction cleaner for cleaning a surface and having a housing comprising
a liquid extraction system mounted on the housing and including:
a recovery tank;
a suction nozzle connected to the recovery tank;
a vacuum source in communication with the recovery tank and the suction nozzle whereby the vacuum source can draw liquid and debris through the suction nozzle and deposit them in the recovery tank; and
a liquid dispensing system mounted on the housing and including:
a cleaning fluid supply tank; and
a spray nozzle connected to the cleaning fluid supply tank whereby cleaning fluid can be sprayed onto a surface through the spray nozzle;
the improvement wherein:
the cleaning fluid supply tank is insulated.

[c20] A liquid extraction cleaner according to claim 19 and further comprising a supply conduit interconnecting the cleaning fluid supply tank and the spray nozzle wherein at least a portion of the supply conduit is insulated.

[c21] A liquid extraction cleaner according to claim 19 wherein the cleaning fluid supply tank is insulated by a double wall with air disposed between the walls.

[c22] A liquid extraction cleaner for cleaning a surface and having a housing forming a handle at an upper portion thereof for carrying the extraction cleaner, and comprising
a liquid extraction system mounted to the housing and including:

a recovery tank;
a suction nozzle fluidly connected to the recovery tank;
a vacuum source in communication with the recovery tank and the suction nozzle whereby the vacuum source can draw liquid and debris through the suction nozzle and deposit them in the recovery tank; and
a liquid dispensing system mounted to the housing and including:
a cleaning fluid supply tank;
a pump connected to the cleaning fluid supply tank and operated by a trigger mounted to an underside of the handle; and
a spray nozzle connected to the cleaning fluid supply tank by way of the pump whereby cleaning fluid can be sprayed onto a surface through the spray nozzle when the pump is actuated by the trigger.

[c23] A liquid extraction cleaner for cleaning a surface and having a housing forming a handle at an upper portion thereof for carrying the extraction cleaner, and comprising
a liquid extraction system mounted on the housing and including:
a recovery tank;
a suction nozzle fluidly connected to the recovery tank;
a vacuum source in communication with the recovery tank and the suction nozzle whereby the vacuum source can draw liquid and debris through the suction nozzle and deposit them in the recovery tank; and
a liquid dispensing system mounted on the housing and including:
a cleaning fluid supply tank;
a spray nozzle connected to the cleaning fluid supply tank for delivery of cleaning fluid onto the surface to be cleaned;
the improvement which comprises:
a lamp assembly mounted to a front portion of the housing and connected to a source of electrical energy for illuminating the surface to be cleaned.